

ABSTRACT OF THE DISCLOSURE

The present invention relates to a gas storage and dispensing system, which comprising a carrier material for a target gas and multiple microtubular elements in contact with such carrier material. Each microtubular element comprises a tubular wall that defines a bore side and a shell side that are sealed from each other, preferably by one or more potting members. The carrier material is either at the bore sides or at the shell sides of the microtubular elements, and it can be either a solid sorbent material for the target gas, or a liquid carrier therefor. Such gas storage and dispensing system is particular useful for hydrogen storage, when the carrier material can be a hydrogen-sorbent that contains hydrogen gas, or liquefied hydrogen, or an organic hydrogen solution, or a metal hydride solution capable of generating hydrogen gas. Such microtubular elements can further be designed as microfibrous fuel cells, while each microfibrous fuel cell comprises a carrier material at its bore side.